

task_klegpky1gugolsq7_with_calculation

Student Group

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Exercise E1 Electron flow

How many electrons pass through a control cross-section of a metallic conductor when the current of $40 \sim \{\rm mA\}$ flows for $4.5 \sim \{\rm s\}$?

Solution

$$\begin{align*} 1.1 \cdot 10^{18} \sim \{\rm electrons\} \end{align*}$$

$$\begin{align*} Q &= I \cdot t \quad \&= 0.04 \sim \{\rm A\} \cdot 4.5 \sim \{\rm s\} \quad \&= 0.18 \sim \{\rm As\} \quad \&= 0.18 \sim \{\rm C\} \quad \&= \{0.18 \sim \{\rm C\}\} \cdot \{1 \over 1.6022 \cdot 10^{-19}\} \sim \{\rm C/electron\} \\ &= 1.1 \cdot 10^{18} \sim \{\rm electrons\} \end{align*}$$

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